12.2 STEP-BY-STEP PLAN TO ACHIEVE CLIMATE NEUTRAL STEEL PRODUCTION

Climate neutrality by 2050: This is the climate target that the European Green Deal has established. Regulatory pressure on the European steel industry, which currently generates more than 6% of EU-wide carbon dioxide emissions from fossil fuels, thus is correspondingly high. Markets, too, especially in the automotive industry, have become increasingly vocal in recent years as to the need for steel products that are produced with the smallest possible carbon footprint.

voestalpine's greentec steel program serves to pursue an ambitious, step-by-step plan for the decarbonization of steelmaking in the long term. In a first step, the Group now offers all flat steel products that are manufactured by its Steel Division in Linz, Austria, in a CO_2-reduced edition as well. Compared with the conventional production route, this approach achieves a direct reduction in carbon emissions by some 10% thanks not only to adjustments in both the reducing agents and the raw materials mix but also to the complete shift to green electricity. This does not affect the excellent quality that our customers expect from us in terms of both materials and processing. Over and above the orders we have already received, there are indications that demand for sophisticated steel products in the greentec steel edition—such as hot finished strip steel, isovac electrical steel strip, or phs-ultraform—will remain high in the future, too.

The next significant phase in voestalpine's step-by-step plan will make it possible to cut the CO_2 emissions from steel production by one third up until 2030 by replacing the existing blast furnace route in part with a hybrid electric furnace route. Scrap, liquid pig iron, and hot briquetted iron (HBI) are the most important pre-materials for the electric furnace route, which will be used for carbon-neutral production of high quality steel in the future. By undertaking intensive R&D activities in the field of materials science, voestalpine ensures going forward that it can manufacture high quality steel grades as before, even though the raw materials mix has changed.

At the same time, the voestalpine Group is intensively researching breakthrough technologies in order to steadily expand the use of green hydrogen in the steel production process over the long term and thus to make voestalpine's entire steel production carbon neutral by 2050. All planned tests on the hydrogen electrolyzer facility have been successfully completed. The generation of hydrogen in an electrolyzer facility using electricity is a typical example of so-called "sector coupling." Currently, this facility is being operated at the Group's Linz plant as a standby for the purpose of stabilizing the power grid.

Various follow-up projects related to the management of hydrogen and CO_2 have been launched. Among other things, they examine the separation and subsequent storage (i.e., carbon capture and storage – CCS) or use (i.e., carbon capture and utilization – CCU) of CO_2 as well as the use of hydrogen as a reducing agent in metallurgical processes. A pilot plant was successfully started up at the Group's Donawitz, Austria, facility as part of the Sustainable Steelmaking (SuSteel) initiative—a groundbreaking project serving to research the direct production of steel using hydrogen plasma. Batch operations have also been launched at the Primetals Hyfor pilot plant, where iron ore fines are reduced to sponge iron using hydrogen.